

## MELOPLASTY.

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SOME months ago I extirpated a verrucous cancrroid tumor, growing from the mucous membrane of the left cheek, extending forwards close to the angle of the mouth, passing round and behind the teeth, as far as the soft palate and infiltrating in such a way the soft part of the cheek, that the front portion of the tumor adhered to the skin and that, as was shown during the operation, both the masseter and the coronoid process of the lower jaw were diseased. In extirpating cancrroid tumors of this size, I have often preferred a secondary plastic operation to a primary one. Certainly, in this case, I had no choice. After having removed the diseased parts of the soft tissues and of the adjacent jaw-bone, it appeared to me, that the probability of a radical cure would be increased by a resolute application of the thermo-cautery to the wound. Once the cauterization done, I had to wait for the cleaning of the wound. After six weeks, however, the aperture had to be reduced. The patient's mouth gaped as far as the left ear, his speech was scarcely intelligible, and a constant discharge of saliva could be observed. My own experience had taught me the difficulties connected with such a plastic operation. I carefully considered how to avoid them, and the gratifying, almost perfect, result attained induced me to study the history of meloplasty. I not only found it very interesting, but it struck me how strikingly the development of surgery is reflected by this particular subject. It is worth while to dwell for a moment on historical details, previous to communicating my mode of operating.

It is unavoidable, for the better understanding of this history, to keep in view, as Velpeau ("Velpeau, Nouveaux Elements de Medecine operatoire." 5me Edition, 1841 et 1842) used to do, two different conditions which necessitate meloplasty. The first condition is met with in that deformity which leaves a great chasm in the cheek and which, communicating or not communicating with the opening of the mouth, is too large to be closed by uniting with sutures the pared edges of the wound. Various modes of operating have been tried to cover such a chasm of the cheek.

According to the Indian method, a flap is loosened and pediculated from the neighborhood of the defect, and this flap ought to fit without too much twisting of its base. In the beginning of our century the French surgeons often followed this method. The neck, as a rule, provided the necessary material: In this way operated Delpech, Lallemand, Dupuytren, J. N. Roux, Gensoul, Ph. Roux; Graefe, 1819, succeeded with the skin of the forehead.

According to the Italian method, a flap is dissected from more distant skin. The extremities yielding the flaps are fixed on the cheek till the skin adheres and the pedicle can be cut. Ph. Roux, 1826, for instance, took the flap from his patient's palm.

In Velpeau's time both methods were disused on account of the mortification of the flaps, and replaced by the French method, *par de collement*, according to which the skin is loosened upward even as far as the orbit and downward even below the margin of the lower jaw. In order to make these flaps join readily without tension, Dieffenbach advised incisions to be made beyond the bases of the flaps, to bridge the chasm in this way. It goes without saying that all these methods were disadvantageous. The defect of the mucous membrane of the cheek remained unremedied and healed by granulation, cicatrization and contraction. In using the French method, after which no fresh skin was interpolated, the disadvantages were felt especially and keenly and only a very careful treatment could prevent the cicatrization of the wound from interfering with the power of chewing. However, in less important cases the result might have satisfied; although Velpeau, finishing his

comments on this subject, says, it will be necessary, should the French method fail, to try again the Indian method, notwithstanding the danger of mortification setting in. Sufficient to show, how uncertain they felt in those days, though in these everything has changed. Antiseptic or aseptic treatment has proved over and over again, that the insufficient circulation of the blood (*per se*) does not easily bring about mortification, if only those pathogenic cocci keep away which invade and overpower the tissue by taking advantage of its enfeebled condition and imperfect nutrition. It is only natural, that nowadays both methods, as well the Indian as the Italian, are recommended in rivalry. Contrary to what happened years ago, in our days, all methods succeed equally well, though our aspirations grow with our knowledge. In the present we do not perform meloplasty without adding a plastic operation on the mucous membrane of the cheek, because we want to prevent from the start the effects of cicatrization. In Velpeau's time they looked on the successful adhesion of two inches of skin as on a remarkable piece of luck; at the present time they dissect the skin as far as the breast and the flaps thrive (Israel, Hahn). The upper end of such a flap is fixed, outside in, on the defect of the mucous membrane of the cheek. As soon as it adheres properly, the pedicle is cut and contains material enough to fill the outside defect of the cheek. (*Verhandlungen der Deutschen Gesellschaft f. Chirurgie*, 1887.

Let us go back to the old days and see how they treated that other condition which necessitates meloplasty, that other much more important condition, although there is no chasm of the cheek in this case, and the mouth closes well enough, too well in fact, because cicatricial tissue has produced a firm closure of the jaws, and the patients, in order to avoid starvation, have to rub soft food between the teeth and to suck through the small openings the fluids on which they live. Such patients, wasted and exhausted, begged the surgeon to free them from their sufferings even at the risk of their lives.

It seems that such cases were not at all uncommon. Noma, at present so rare that surgeons of great experience may have never met with it, was common in those days. But the chief reason for the multiplication of those cases existed in the vio-

lent and destructive inflammations of the inside of the mouth, produced by a too liberal administration of mercury. The therapeutical action of mercury was not considered beneficial as long as it did not make an ulcerating inflammation of the mouth. And mercury was given in several morbid conditions, in which its use is quite given up now. In such cases the upper and lower pouch of mucous membrane, either of one or both sides, were gone. A short, solid and rigid cicatrix kept the jaws set. It sometimes occurred, that dead pieces of jaw-bone or loosened molars, involved in the midst of this cicatricial tissue, maintained suppuration and ulceration. A thin, brownish fluid constantly dribbling from between the pouted lips, diffused a dreadful perfume. Add to these symptoms an extreme leanness, and it will be easy to imagine, how the desire to help could only be surpassed by the stubbornness of the ailment.

And so it is easily understood, that an attempt at help was made, disregarding the clumsiness of the means.

For the first time, in 1859, Esmarch had pointed out in a comprehensive way that the pouches of the mucous membrane of the cheek are essential. In the opening of the jaws, they expand till they vanish, this expansion being necessary for the flexibility of the inside of the cheek. But it was known a good many years before that the worst cases of closure of the jaws are characterized by the absence of these pouches. When only a rigid band closed the jaws, the cutting, or still better, the cutting out, of this, sufficiently improved the state of affairs. But the difficulties set in when the whole inside of the cheek was one retracted scar. In the bloom of tenotomies, the muscles, masseter and temporal, had to follow suit, though the latter reacted with vehement bleeding. But at that time already a more rational treatment had been established. According to the French method, the cheek is loosened from the upper and the lower jaw upward and downward, so that the loose cellular and fatty tissue was widely opened. This loose tissue could temporarily fulfil the duties of the mucous pouches of the cheek; it was only necessary to prevent the agglutination of the raw surfaces facing each other. Keeping the jaws constantly opened is of as little use as operating

with wedge, screw-gag, or more complicated instruments. The most ardent zeal could not hinder the old state from slowly and slowly coming back. Was the painful treatment interrupted for a few days, the union seemed to be as firm as ever. An obvious experiment to try was whether, perhaps, foreign bodies, placed and fixed in the raw pouches, would lead to a better result. In 1799, Rudtorffer applied lint. Cork and especially small plates of lead were certainly a much better material, but Velpeau liked the one as little as the other. In 1848 Schuh tried to keep the cheek separated from the jaw with a piece of adhesive plaster, which was put in as a seton, passing, opposite to the fossa canina, through an incision of the upper lip, curving between the cheek and the jaw, leaving the mouth through another incision just before the ramus of the lower jaw. Silver plates, modelled exactly upon the grinding sides of the upper and lower jaw, and provided laterally with ascending and descending wings, covering the alveoli of the jaw, and preventing in this way the union of the opposite surfaces, agreed better with the present ideas of treatment of wounds. Christopher Heath, the well known author of "Injuries and Diseases of the Jaws," still praises the salutary effect of this prothesis, which, worn for many months, should restore original integrity. In June, 1887, this Hunterian professor of surgery and pathology stated in a lecture ("Closure of the Jaws," *Brit. Med. Jour.*, 1887), delivered before the members of the Royal College of Surgeons of England, that, under the influence of those silver plates, the surface of the wound is covered with a fresh mucous membrane, even at those places where not a trace of mucous membrane remains in the vicinity. According to the results attained, he completely rejects Es-march's opinion that the mucous membrane does not regenerate, but is always drawn over the wound. As far as I know, Heath is unique in this assertion. But it is perfectly clear that, after excision of a cicatrix, or after "decollement" in trifling cases, such plates may be of great advantage, because the remaining part of the mucous membrane gets time to be drawn over the wound.

Dieffenbach aimed more directly when he endeavored to provide the wound of the mucous membrane with the same

tissue by transplantation. Seeing that this idea was not readily taken up, we may safely admit that the difficulties could not be technically overcome. Dieffenbach himself tried this mode of operating, but he always thought, till he died, in 1847, that the bad cases of cicatricial closure of the jaws were utterly incurable. And now we see the glimmering of a new idea through the mist of imperfect endeavors. Would it not be practicable to use the skin as a substitute for the lost mucous membrane?

Mutter may be regarded as a pioneer in this new era. In a case of closure of the jaws, caused by fibrous bands, which were situated just behind the commissure of the lips, and which greatly reduced the aperture of the mouth, a V-shaped piece of skin, with the apex in the angle of the mouth, was dissected from the underlying mucous membrane; next the exposed cicatrix was divided from the outside of the mouth as far as necessary, and, finally, the V-shaped piece of skin was turned inside and fixed on the wound of the mucous membrane. Thus, in analogy to Roser's operation for phimosis, the wound of the mucous membrane was covered with a triangular piece of skin and at the same time the commissure of the lips was shifted. (*Gazette Medicale*, 1837, December 16; cited in *Verneuil's Archives generales de Medicine*, Vme. Serie., t. xv., 1860.

Previously, in 1834, Valentine Mott, the American surgeon, had gone much further in substituting the mucous membrane by the skin. Many times it was necessary to divide the commissure of the lips and even the cheek, in order to loosen properly the soft parts from the upper and lower jaw, and, especially, in order to remove sequestra. The operation having been performed, the wound of the cheek was joined by sutures. Mott had the courage not to close the wound. The cheek divided as far as the masseter muscle, remained gaping and both edges of the wound had to heal separately. In this manner it was much easier to further and restore the mobility of the lower jaw. After re-establishment of sufficient mobility, the time came to reduce the aperture of the mouth. Velpeau, (*loc. cit.*) uses the following words to describe the operation.

"M. Mott s'est cru forcé dans quelques cas de fendre largement la commissure de lèvres comme Tenon, et de laisser cicatriser isolément chaque bord des plaies pour ne les réunir qu'après avoir assoupli complètement les mouvements des mâchoires. Mais c'est là une opération qui, malgré ce qui en a été dit au nom de M. Mighles (*Gazette Médicale*, 1834, No. 26), et de M. Mott (*Journal des progrès*, T. xiii, p. 256), et ce que m'en a écrit récemment son auteur, est encore trop mal connue parmi nous pour que je puisse en donner une appréciation définitive." (T. ii, p. 204).

And further, "Comme M. Mott, j'ai voulu voir une fois si, *fendre* toute la *joue* depuis la commissure jusqu' auprès du muscle masséter, pour disséquer ensuite chacun des bords de l'incision et les laisser cicatriser séparément, de manière à les recoudre plus tard comme on le fait dans le bec-de-lièvre, réussissait mieux. La joue étant ainsi fendue, ne gêne plus les mouvements de la mâchoire, qu'on peut d'ailleurs assouplir, agrandir par les moyens mécaniques convenables. Une fois, qu'on a obtenu sous ce point de vue tout ce qu'on peut désirer, on recoud les bords de la division artificielle. Comme la face interne de chacun des lambeaux a eu le temps de se cicatriser, on ne craint plus qu'il se recolte à la face externe des gencives."

I quoted verbally to show better, what I have added myself in the text.

But now the wound in the cheek has grown together with the parts in the mouth, where the mucous membrane was wanting. The outer surface of the alveoli might be totally covered with skin, which when meloplasty is performed, might partly remain and serve as a new mucous membrane. For this purpose it was only necessary to begin the cutting a little distance from the teeth; a coalescence between the alveoli, now covered with skin, and the inside wound of the newly made cheek was then impossible, and the plastic operation on the gum was finished, leaving alone the other question, how to execute the meloplasty. Velpeau applied Mott's mode of operating only once, although he was not very successful, he recommends the method for future attempts. Since that time, however, Mott's method seems to have been forgotten.

The *Dictionnaire Encyclopedique des Sciences Medicales*, 1872, 2me. Series, T. V., p. 409, gives a most comprehensive exposition of our subject, but only the following trifling reference to Mott: "Dan le cas de Mott le Chirurgien Américain incisa toute l'épaisseur de la joue et pratiqua la suture après avoir fait l'écartement forcé. Esmarch, Victor von Bruns (*Die Chirurgische Pathologie und Therapie des Kau- und Geschmacks-Organen*, 1859), and also Verneuil, quoting Esmarch (*Archives generales de Medecine*, V. Series, TXV., 1860) have

in reference to Mott's method, nothing else to say but that the total division of the cheek may be necessary in order to cut the cicatrices sufficiently. Heath, mentioning Mott, does not say a word in addition to the above quotations, either in his monograph of more than 500 pages, 1868, or in his lectures.

(All these authors refer to Mott's first publication in the *American Journal of Medical Sciences*, Nov., 1829. Velpeau refers to later publications). Péan, who republished in 1876 Nèlaton's handbook on our subject, deals with various forgotten methods, but not with Mott's. O. Weber, the writers on Diseases of the Face in Pitha and Billroth's *Handbuch* 1866-1873, makes it worse by saying:

Zur Spaltung der Wange, die noch von Einigen empfohlen wird, ist gar keine Veranlassung, da die äussere Haut, wenn sie nicht in den Vernarbungsprozess hineingezogen ist, kein Hinderniss abgibt. Wo aber die Haut mit der Narbe selbst verwachsen ist, muss die Trennung der inneren Adhäsion mit einer plastischen Operation zur Herstellung eines normalen Mundwinkels U. S. W. benutzt werden.

Yet, it was not only Mott who invented this way of operating.

In "Gunther's Lehre von den blutigen Operationen (Heft 111 Operationen an den Lippen und Wangen, 1866, p. 109). Blasius makes much the same proposition, only he is still more radical. In the same way as Mott, Blasius suggests the division of the cheek and the attachment of both edges of the wound separately to the upper and lower jaw. After the union, however, he cuts the cheek more distantly from the teeth, so far, indeed, that flaps can be made from the exaggerated gums, which flaps dissected from the jaws, turned over and united to each other by sutures, may form the inside of the cheek. The outside of the cheek may be obtained par décollement.

Jaesche, afterward, reinvented Mott's method, applied it with fair success, and has published his case. (*Med. Zeitung Rnsslands*, 1858, s. 27, cited in Jaesche's later communication). Jaesche's method since its publication has been reported in a most inadequate way, for instance, by Esmarch, (*loc. cit.*) who, dealing with Dieffenbach's transplantations of mucous membrane adds: "Au lieu de muqueuse un lambeau cutané."

I believe Jaesche's communication would have been completely forgotten, as well as Mott's method and Blasius' propo-



sition, had not Jæschke reopened the question in 1868 by describing a second case, operated in the same way with the same success. (*Langenbeck's Archiv* Bd. ix., 1868, s. 526.

After having been spoken of as "Jæschke's method" by Gussenbauer, in his paper on "Meloplasty" (*Langenbeck's Archiv* Bd. xx, s. 526) it obtained, together with Gussenbauer's method, a standing place in the modern literature of our subject. After the above exposition it must be clear that, if one likes to give a special name to this method, it must be called after Mott. Yet, how would it look, if every plastic operation performed somewhere and somehow had to be named? Every plastic operation has its own peculiarities and in this way every surgeon would have a right to be entitled to eternalization. An operation deserves the honor of a distinct name if it is typical, if it is not a matter of course, and if it produces special results. Thus tested, the method has to be called after Mott. If the division of the cheek and the subsequent separate union of both edges of the wound are looked upon as the characteristic part of the method, leaving the mode of forming the cheek, to circumstances, then, certainly this way of reconstructing the gum is typical enough to receive a special name. "Granted," somebody may say, "but this division of the cheek is too simple to deserve that honor; it is quickly executed and it requires no skill whatever." True, but it is far from easy to resolve upon such a mutilation. History has taught us that only a few surgeons, and these only after having experienced the uselessness of various other methods, have come to this simple division of the cheek.

But this operation, is it really so advantageous? Why is it constantly forgotten, and why is it necessary, after half a century of its existence, to plead for its rights?

To explain this, another short historical digression may be allowed. I have exposed the difficulties connected with simple meloplasty at the time of Velpeau and Dieffenbach; I have set forth how the success of Italian and Indian methods was always imperiled by the danger of mortification, and how, therefore, though procuring less skin, the French method became a thing of necessity. Well, Mott's method could not be received with general approbation, since the final stage of me-

loplasty was too difficult at that time. That was the weak part, which buried it in oblivion every time, and rightly so.

That it has still to be brought to daylight, while everywhere else antiseptic treatment has revolutionized surgery, is due to the introduction of Esmarch-Rizzoli's method. That method of operating improves so much the cases of cicatricial closure of the jaws, that till this day it enjoys a general approval. But a more critical comparison will show at once that at present there is no reason for its dominant position. Esmarch Rizzoli's method, invented by Esmarch in 1854, applied by Wilms in 1858, and independently invented and performed in 1857 by Rizzoli, leaves the contracted cheek alone, but restores the mobility of the healthy part of the lower jaw by making a new joint before the cicatrix. This operation is tolerably simple, it will answer the purpose if well executed, and it is not dangerous in our days. But the functional restoration of the healthy half of the jaws is the highest purpose intended. Even this cannot be attained, as the movable part of the lower jaw is inadequately supported by the joint and for this reason the jaw will turn to the median line, by which turning the teeth, if they still touch, are pressed against each other obliquely and with little power during the act of chewing. The faculty of taking food may be normal, the faculty of masticating food is not normal at all.

Functionally, as well as cosmetically, there is a great something to wish for. And, as marasmus may be produced by the loss of teeth, it is not safe to think lightly of the privation of one side, and an important functional deficiency of the other side of the jaws.

Without a doubt, Mott's method is preferable, if results are compared. It gives a jaw provided with normal articulations and with muscles at both sides. What can be saved, is restored to use. And if the teeth miss at one side, prothetic dentistry may furnish the means of relief. At the present time it is obvious that, technically, Mott's method is not only an infallible way of procuring gum, but also of procuring mucous membrane in the hindmost parts of the mouth. If necessary the end of the incision of the cheek is enlarged in two directions, so that a V-shaped wedge of skin is formed, which

is turned outside in between the upper and lower jaws, gets its apex close to the soft palate, being fixed here by sutures. No rule can be laid down for procuring the farther material for meloplasty. *Variis modis bene fit.* The Italian method is practically omnipotent, Keetley exchanged by transplantation a big nævus pilosus of the cheek of a child, three months old, with a piece of integument from the upper arm, reaching from near the shoulder to near the elbow. As a pedicled flap, the birthmark was united by sutures to the wound of the arm, the skin of the arm united to the wound of the cheek, and after eleven days both pedicles were cut and the transplants adjusted. (*Lancet*, February 19, 1887.) In Billroth's Klinik it is demonstrated that a flap may wander from the back to the upper arm and from the upper arm to the face. (*Langenbeck's Archiv*, xxxvii S. 91). Rotter passed a flap from the arm through a fissure in front of the masseter muscle into the mouth and saw it take. (*Munchener Med. Wochenschrift*, 1889, No. 30-32; related also in the ANNALS OF SURGERY, April, 1890.) The Indian method does not lag behind. It appeared to Gersuny that a pedicle, merely composed of loose cellular tissue, was sufficient to keep till the definite union a flap alive, which passing an incision above the jaw was spread on the inside of the cheek. (*Centralblatt f. Chirurgie*, 1887, s. 706.) Moreover, the practicability of using a wandering flap exists here as well. As early as 1877, Gussenbauer tried it in his rightly famous case of meloplasty. A flap backward pedicled, was loosened; the cheek was divided; the front part of the flap was turned inside round the masseter and fixed by sutures to the hindmost part of the wound of the mucous membrane. Afterward the pedicle was cut, brought inside and forward, and fixed close to the commissure of the lips. In this way the integument of the cheek was turned outside in two turns and the outside wound was covered with a flap from the neck. (*Langenbeck's Archiv* xxi, s. 526).

The method of Israel and Hahn, mentioned before, intends the same but more simply. Besides this, both methods, as well Italian as Indian, will be still more simple, if combined with Thiersch's skin-grafting. In that case one flap will do of

which the raw surface is covered with small pieces of epidermal skin, either before or after the transplantation. Enough to show how far the sphere of meloplasty is extended in harmony with the sphere of plastic operations generally, and even beyond the dreams of our predecessors. This is due to antiseptic surgery. But it may be that an aseptic course will never be a dead certainty. For this reason, I venture to communicate a method of meloplasty of which the results may be expected with still more confidence, as the nutrition of the flap is perfect.

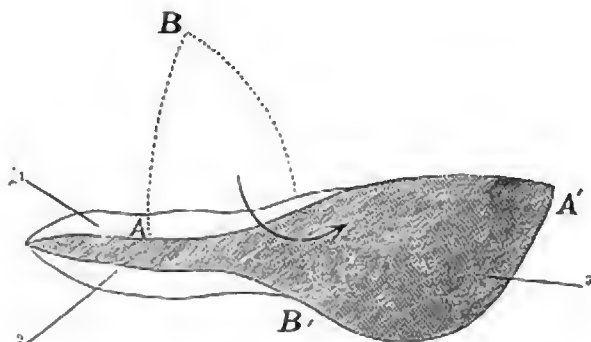


FIG. 1.—DIAGRAM SHOWING CONSTRUCTION OF FLAPS.

1.—Upper Lip. 2.—Lower Lip 3.—Chasm. A, A' and B, B', points approximated.

M. Bloks, æt. 45, about a year ago perceived an affection of the inside of the left cheek, and for a few months has felt radiating pain in the left part of the face, in the neck and in the occiput. There exists an *ulcus papillomatosus* covering the whole inside of the left cheek from close to the angle of the mouth as far back as the soft palate and at a few places extending on the gum. In pressing this ulcerated tumor, numerous small white bodies come in sight, which microscopically appeared to be polymorphous epithelial cells. The front part of the tumor is slightly attached to the skin. The glands are swollen behind the angle of the lower jaw. On January 27, 1890, extirpation of swollen glands was performed, the submaxillary gland included. Then extirpation of the tumor. For this, the cheek is divided from the com

missure of the lips to an inch in front of the tragus ; the attached skin is widely removed, a good deal of the masseter muscle is sacrificed, the second and third molars of the lower jaw are extracted, the hind portion of the tumor is removed together with a rather large piece of bone. Afterward the Pacquelin's thermo-cautery is applied for a long time, especially to the lower jaw and to the masseter and pterygoid muscles. In the front part of the wound the skin and mucous membrane are united by sutures



FIG. 2.—FINAL RESULT OF PLASTIC OPERATION ON CHEEK.

March 5, a return in the form of a papillomatous wart of the fissure of the cheek, is widely extirpated, and the following plastic operation is executed in imitation of Estlander's method of cheiloplasty, which mode

of operating I have followed a few times very successfully: I constructed a triangular flap from the upper lip and the adjacent part of the cheek. The peduncle, however, being only vermillion border but containing the arteria coronaria, remained outside. Turned in the direction of the arrow, the point A was secured by sutures to the point A', the point B to the point B' and the rest according to fitness. See Fig. 1.



FIG. 3.—SHOWING THE EXTENT TO WHICH THE MOUTH CAN BE OPENED.

After eight days the sutures were removed. Healing by first intention. March 22, patient left the hospital with a small fistula above the transplanted vermillion border

August 26. No return either local or lymphatic. Maximum sepa-

ration of the incisors  $\frac{3}{10}$  of an inch. The patient would like to open the mouth more widely and to have healed up the fistula, in which food is caught now and then. Behind the fistula there is a rigid cicatrix, parallel to what was formerly the anterior margin of the masseter.

This cicatricial tissue is divided. The wound in the inside of the cheek is covered with the vermillion border from the margin of the fistula and over this, after paring, the skin is joined by sutures. September 23. No return. The fistula is closed.

A few hairs originally belonging to the median portion of the moustache are visible in the back of the cicatrix of the mucous membrane. When the jaw is set, the transplanted flap, which is very flexible, measures in length  $1\frac{1}{2}$  inch, in breadth  $\frac{3}{4}$  of an inch. The measures inside are about equal and the marks scarcely visible. The maximum distance of the incisors is now fully an inch. (See Fig. 3.) The normal distance ought to be about  $1\frac{1}{2}$  inch. In the beginning of October this distance is increased to  $1\frac{1}{10}$  inch. From a cosmetrical standpoint the oblique aperture of the mouth, when opened, is the only thing which does not look very well. February, 1891, *idem*, no return.

For a due appreciation of the result obtained, it may be remembered that E. Kuester, in 1885, cleft the cheek, divided the lower jaw with a saw behind the juncture of the masseter, exarticulated the exposed carcinomatous tumor. In this way he treated two cases, which according to the description were not worse than mine. One of the patients died from pneumonia and mediastinitis suppurativa posterior. The other healed, recovered nicely; but Kuester adds:

"Die Nahrungs-Aufnahme war wenig gehindert obgleich die Zaehne der beiden Diefen nicht genau auf einander possten. Die Möglichkeit den Mund zu oeffnen, ging bis fast normalen Grenzen." (*Deutsche med. Wochenschrift* 1885, No. 50, cited in *Centralblatt f. Chirurgie*, 1886, s. 311).